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AUTHOR Strasler, Gregg M.
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ABSTRACT

Few studies of mastery learning deal specifically with retention and transfer of learning or emotional outcomes. To determine whether learning for mastery students were better able than students in nonmastery classes to acquire higher academic self-concept scores, pre- and post-test scores on three affective measures were examined for 93 seventh grade students. In the experimental study of 23 class days, the means of the learning for mastery students either increased slightly or remained constant. In contrast, the means of all three affective measures decreased slightly for the nonmastery learning students. Although results revealed no significant differences between the groups, the findings seem to favor the learning for mastery approach. (Author/JAC)

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AFFECTIVE OUTCOMES IN A LEARNING FOR MASTERY SETTING

Gregg M. Strasler
University of South Carolina

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Affective Outcomes in a Learning for Mastery Setting

Gregg M. Strasler

South Carolina Region V Educational Services Center

and

University of South Carolina

Introduction

Traditionally, instructional programs have been evaluated through the criterion of immediate achievement; that is, achievement that can be demonstrated immediately upon completion of an instructional program. The majority of educational research in determining program effectiveness has been centered on such learning criteria as rate and accuracy of performance. Typically, the "effectiveness" of an instructional program is measured by the average number of items answered correctly by a group of students on a posttest. The quality of instructional programs should be enhanced if other learning criteria were used in addition to or as a substitute of immediate achievement in the evaluation of classroom instruction.

One instructional program that has been receiving increased attention in recent years has been termed mastery learning. In essence, mastery learning programs contain six components: objectives, preassessment, instruction, diagnostic assessment, prescription, and postassessment (Torshen, 1977). Although a variety of mastery learning strategies is currently in existence, they are basically derivatives of the two best known mastery learning strategies: Bloom's (1968) "learning for mastery" strategy and Keller's (1968) "personalized system of instruction." Because it can be immediately adapted to the classroom, Bloom's group-based approach to mastery learning has come to the forefront in American education.

Bloom's learning for mastery instructional model utilizes a set of prespecified instructional objectives in which non-graded formative tests are given on a regular basis to diagnose individual as well as group progress in instruction. These tests also provide immediate feedback to the students so that they may receive remedial instruction if needed. Only an end-of-unit or end-of-course summative test is used as a criterion for grading purposes. Since the summative test is criterion-referenced, students work toward a common goal of "mastery" rather than being concerned where they might be placed on a normal curve in relation to their fellow students.

Following Bloom's 1968 article "Learning for Mastery," a number of experimental and quasi-experimental school-based studies on mastery learning has been conducted. A number of findings (ef. Block, 1971, 1974; Block & Burns, 1976) support the hypothesis that mastery learning strategies are more effective than the conventional strategies of lecture-recitation or lecture-discussion. However, immediate achievement has been the learning criterion predominantly used to support the effectiveness of mastery learning in the classroom. The quality of mastery learning research, like more classroom research, appears to be limited in focus. Until recently, school-based research has not addressed other possible student learning outcomes inherent in the learning for mastery approach.

The effectiveness of classroom instruction has been determined primarily through the use of measures of immediate achievement. However, in the past few years there has been a small but growing body of evidence supporting the notion that the mastery learning approach not only influences immediate achievement, but also affects the following domains of learning outcomes: intellectual, emotional and social-interpersonal (ef. Block, 1974; Block and Anderson, 1975; Block and Burns, 1976). In addition to immediate achievement, intellectual outcomes include the broad area of transfer of learning (i.e., the ability to apply past learning to either the solution of new problems or to the facilitation of new learning). Emotional outcomes include such aspects as attitude toward subject matter and affective traits as self-concept and mental health. Social-interpersonal outcomes involve such processes as cooperation with other students in learning and the development of self-responsibility.

Although intellectual, emotional and social-interpersonal outcomes appear to be inherent in the learning for mastery model, research in these areas is not clearly defined. With regard to intellectual outcomes, few studies in mastery learning research deal specifically with the areas of retention and transfer of learning. Research studies involving emotional outcomes deal primarily with attitudes towards subject matter learned and not with affective traits such as self-concept and mental health. Evidence concerning the learning to learn phenomenon in mastery learning approaches has primarily been based on speculation.

The nature of the problem raised in this introduction is that school-based mastery learning research, like other types of classroom research, typically measure "effectiveness" by means of one learning criterion; namely, the criterion of immediate achievement. What, then, are the possible avenues of approach in investigating the various outcomes mentioned above in the framework of Bloom's learning for mastery model?

Due to the constraints imposed upon experimental research in school-based settings (e.g., time, cost, etc.), the present study did not incorporate all of the learning criteria mentioned in this chapter. There appear to be three general areas in which the effectiveness of classroom instruction can be assessed. These areas include the cognitive and affective outcomes of school learning and the learning environment itself. The present study was conducted to investigate the effects of the mastery learning model on one variable within each of these three areas: transfer of learning (representing the cognitive area), academic self-concept (representing the affective area) and classroom cohesion (representing the area of the learning).[1]

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[1]The present study is more fully described in an unpublished doctoral dissertation (Strasler, 1979). Only the area of academic self-concept (representing the affective area) will be presented in this paper.

Academic Self-Concept and Mastery Learning

One student learning outcome inherent in the mastery learning approach to school learning involves emotional outcomes (Block & Anderson, 1975). Emotional outcomes include such aspects as attitude toward subject matter and affective traits as self-concept and mental health. While the literature indicates that students in learning for mastery approaches develop more interest in and more positive attitudes toward subject matter learned than students in nonmastery approaches, few published studies indicate whether the effects of mastery learning instruction on such affective traits as self-concept and mental health are positive or not.

In recent years, there has been a sharp increase in the number of studies on self-concept (cf. Purkey, 1970; Yamamoto, 1972; Kirkel, 1971). This observation may be an indication of the reemphasis on noncognitive outcomes (e.g., social and affective outcomes) of education in addition to the well established cognitive (achievement) outcomes. Shavelson et al. (1976) state that "self-concept, then, whether used as an outcome itself or as a moderator variable that helps explain achievement outcomes, is a critical variable in education and in educational evaluation and research" (p. 408). Shavelson et al. further state that the majority of self-concept studies examine correlations between a measure of self-concept and measures of other constructs (e.g., achievement), differences in mean self-concept scores among different populations of students, and changes in self-concept attributable to some treatment. In conclusion, Shavelson et al. emphasize that considered as a body of research, self-concept studies lack the focus that would result from an agreed upon definition of self-concept, lack adequate validation of interpretations of self-concept measures, and lack empirical data.

The criticisms noted by Shavelson et al. on self-concept studies are also applicable to mastery learning research. Although the affective trait of academic self-concept appears to be an inherent student learning outcome in the mastery learning model, Torshen (1977) comments that research on mastery learning implementation has focused on cognitive rather than affective outcomes.[1] She mentions that relative to the number of studies investigating cognitive factors, few studies have included any assessment of affective factors. In addition, Torshen notes that most of the mastery learning studies reviewed used relatively short self-report questionnaires to measure highly complex affective variables (e.g., academic self-concept).

As indicated in his reviews of mastery learning research, Block (1971, 1974) points out that there have been virtually no studies on the effects of

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[1]Bloom (1971) attributes 25% of the variation in school achievement to general academic self-concept. If students receive evidence of mastery within school subject matter and courses covered, then they may develop more favorable attitudes toward school learning. Given the positive relationship between self-concept and school achievement cited throughout this section, academic self-concept would appear to be an inherent student learning outcome in the mastery learning model.

mastery learning instruction on such affective traits as self-concept and mental health that may develop over long periods of time. Although Bloom (1976) has shown that subject-related affect increases over short periods of time in favor of mastery learning instructed students (cf. Block, 1970; Arlin, 1973; Anderson, 1973a), Block and Burns (1976) question whether some of the more favorable findings in "Type 2" mastery learning research might be attributable to a Hawthorne effect. As indicated by Block and Burns, more research is needed under the Type 2 category of mastery learning research: "If it works, then what might follow?"

Directional Hypothesis Testing for Differences in Academic Self-Concept Among Mastery Learning and Nonmastery Learning Students

Academic self-concept. From the research cited in the review of the literature, numerous studies have been conducted on self-concept within recent years in terms of correlations with achievement measures. As previously stated by Shavelson, et al. (1976), the construct of self-concept has become an important variable (as a student learning outcome or as a moderator variable that helps explain achievement outcomes) in educational evaluation and research.

A number of studies reveals a positive relationship between student self-concept of ability and academic achievement. Malpass (1953) states in his findings that definite relationship exists between measures of students' perceptions of school (e.g., school in general, teachers, classmates) and their achievement in school. Bloom (1971) estimates a correlation of +.50 between a student's perception of his academic ability and his level of academic performance. Brookover et al. (1964) reveal a significant positive relationship between self-concept of ability and grade point average. In addition, studies by Torshen (1969) and Kifer (1973) indicate a positive correlation between academic self-concept and school achievement (teachers' grades).

Although the research cited indicates a strong relationship between academic self-concept and student achievement, researchers tend to "predict" achievement using a combination of aptitude tests and affective variables or to "discriminate" between under- and over-achievers using a battery of affective measures (Kifer, 1975). Based on his 1973 findings (elaborated in Chapter Two), Kifer (1975) believes that it is the student's history of consistent success or failure (in terms of patterns of academic achievement) which attributes to the learner's affective traits. As Kifer (1975) further elaborates:

> Viewed from this perspective, important questions are centered around how school achievement behavior and personality characteristics are related over time and over a series of tasks. And, payoff is not the prediction of achievement but the effects of patterns of achievement and, not effects at only one point in time, but effects as a result of years of experience in the school setting. (p. 193)

In essence, Kifer points out that students develop affective characteristics concomitantly with academic "success" in the school environment.

If Kifer's view is taken (i.e., successful achievement is an antecedent to high concept of ability), then the results of his study (Kifer, 1973) should have straightforward implications in regard to the mastery learning model of school learning. In the mastery learning model, achievement is viewed as a manipulable variable and students are helped to attain high levels of achievement. Therefore, the learning for mastery strategy may be expected to influence the students' levels of achievement as well as their academic self-concept. In other words, increases in student achievement should lead to increases in academic self-concept. Based on the observations made on academic self-concept, the following hypothesis can be constructed.

H_1: Students in mastery learning instruction will acquire higher academic self-concept scores than students in nonmastery instruction.

Scott's academic self-concept scale. The hypothesis addressed in the experimental study deals with academic self-concept. Scott's Academic Self-Concept Scale was selected to be administered to students in this study before and after experimental treatment because the scale had been logically and empirically validated.

Previously, academic self-concept has been viewed as a unidimensional construct rather than being considered as multidimensional in nature. Typically, academic self-concept scales used in measuring this construct have been described and used as single summated scores. Perhaps, as Shavelson et al. (1976) and Bloom (1976) intimate, academic self-concept may be multidimensional and even hierarchical in scope.

The suggestion that academic self-concept may be a multidimensional construct has been supported by Scott (1975). In studying the dimensionality of academic self-concept and its relationship with respect to school achievement and IQ, she administered a 12-item Brookover Self-Concept of Ability Scale to 134 seventh grade students who were randomly stratified with respect to race and sex. Using the principal components method of factor analysis, Scott identified three major rotated factors in the Brookover Scale with eigenvalues greater than one. The first factor (five items) appeared to measure the student's "relative" assessment of his school ability. A second factor (two items) seemed to measure the student's perception of his academic capabilities (e.g., ability to complete college; what kind of grades the student thought he was capable of attaining) independent of what significant others thought of him. Three items formed a third factor which appeared to be based on the importance a student attached to his school work. In addition, Scott concluded from her findings that variation in school achievement (as measured by the language arts and nonverbal subtests of the Comprehensive Tests of Basic Skills and by school grades received during two consecutive nine-week quarters) could be accounted for by one or more of the three factors in addition to the influence of IQ, sex, and race.

Based on her findings, Scott (1975) logically and empirically validated a 15-item scale (Scott's Academic Self-Concept Scale) comprised of three factors (five-item subscales) closely related to those found in the Brookover Scale. These factors (subscales) were defined as the student's perceptions of: (1) his academic ability in relation to the achievement of his classmates and with respect to the significant feedback he receives; (2) his academic ability independent of his reference group and the present judgments of significant others; and, (3) the importance of his school work. In one study (Scott & Anderson, 1976), correlations of this scale with students' grades ranged from +.40 to +.55 in a sample consisting of 105 high school students. The Cronbach alpha reliability estimate for the sample was +.84.

As indicated by Scott, the three subscales of her instrument were logically and empirically validated on students whose characteristics may not resemble those of students in other samples. She recommends that a principal factors method of factor analysis followed by varimax rotation be used in order to determine whether these three subscales are applicable and representative of the present sample under study.

In compliance with Scott's suggestions, a principal factors method of factor analysis of the scale administered to the sample of 93 students in the present study revealed two major rotated factors (orthogonally rotated), each possessing eigenvalues greater than one. Items were scored dichotomously and only factor loadings greater than .50 on both the pretest and posttest were included in the two subscales (factors). These two subscales were identified as a "general school self-concept" (7 items) and a "norm-referenced self-concept" (4 items), respectively.

Tables 1, 2, and 3 are presented to show the means, standard deviations, and reliability estimates of these affective measures for the 93 students in the present sample as well as to display the orthogonally rotated factors and the subscales determined by these factors.

Table 1
ASC Factors (Orthogonally Rotated)

Item No.[a]	Factor I		Factor II	
	Pretest	Posttest	Pretest	Posttest
5	.7674	.9010		
7	.6817	.8727		
8	.7650	.8545		
9	.6955	.9194		
10	.8197	.8360		
11	.7043	.8581		
14	.7951	.8741		
2			.7923	.8610
6			.8145	.8712
12			.7647	.7607
13			.7217	.7213

Note. Only factor loadings greater than .50 on both pretest and posttest have been entered in the table.

[a]Items are ordered sequentially with respect to the two orthogonally rotated factors.

Table 2
Means, Standard Deviations, and Reliability Estimates of Affective Measures before and after Experimental Treatment for 93 Students

Affective Measure	Mean (SD)[a]	Coefficient Alpha
Pretest		
Academic Self-Concept	11.51 (2.39)	.72
General School Self-Concept	6.83 (.54)	.55
Norm-Referenced Self-Concept	1.79 (1.56)	.80
Posttest		
Academic Self-Concept	11.46 (2.53)	.75
General School Self-Concept	6.76 (.68)	.62
Norm-Referenced Self-Concept	1.85 (1.58)	.81

Note. The number of items in each of the affective measures were as follows: Academic Self-Concept (15 items); General School Self-Concept (7 items); Norm-Referenced Self-Concept (4 items).

[a]SD = standard deviation

Table 3
Subscales Determined by the ASC Rotated Factors

Factor I (General School Self-Concept)

5. The grades I get in school show me:

   a. that I am smart
   b. that I studied hard
   c. that I need to study harder
   d. that I don't know much
   e. not much of anything.

7. I believe my school work is:

   a. generally worth thinking about
   b. usually worth thinking about
   c. sometimes worth thinking about
   d. rarely worth thinking about
   e. not important enough to think about.

8. My family expects my school work to be:

   a. mostly A's
   b. A's and B's
   c. B's and C's
   d. mostly c's
   e. my family doesn't expect much.

9. The grades I get in school are:

   a. very important
   b. important
   c. sort of important
   d. not worth worrying about.

10. I usually try to get grades that are:

   a. mostly A's
   b. A's and B's
   c. B's and C's
   d. C's or just passing
   e. I don't try to get any particular grades.

11. When I do my school work it's important to me to:

   a. really know the material well, no matter how long it takes me
   b. spend enough time to know the material fairly well
   c. know the material enough to get through as quickly as I can
   d. get my work finished as quickly as I can.

Table 3 continued
Subscales Determined by the ASC Rotated Factors continued

14. When I think about everything we do at school:

a. my work is the most important thing
b. my work is important along with other things
c. my work is not as important as some things
d. my work doesn't matter at all.

Factor II (Norm-referenced Self-Concept)

2. Compared to my friends, I am probably:

a. really smart
b. smart
c. just average
d. sort of dumb.

6. My teachers usually think I am:

a. one of the smartest in the class
b. smart
c. average
d. dumb.

12. Because of the way I act in class, most of the kids think I am:

a. really smart
b. smart
c. just average
d. sort of dumb.

13. I would grade my school work in general as:

a. outstanding
b. good
c. average
d. below average or sometimes failing.

Summary of Experimental Study and Results

Experimental study. The sample consisted of 93 seventh grade students selected from two junior high schools (three classes per school) located in a southeastern metropolitan area. These schools were selected so that they were as similar as possible with regard to size, location, etc.

The experimental study involved a total of 93 seventh grade students for 23 class days of instruction in two mini-courses (ecology and geometry). Of the total number of students, 47 students in three classes were assigned to a "learning for mastery" (Bloom, 1968) instructional mode and the remaining 46 students in three other classes served as a control. Although both instructional modes were based on the same objectives and content for each unit of instruction, the learning for mastery students received immediate feedback and corrective procedures for each one of the three "learning exercises" (formative tests) administered in the ecology and geometry mini-courses. The learning for mastery students also received additional time in the classroom in the form of small group (four to five students per group) discussion. These small group discussions, led by ninth grade honor students, were designed to help the students with any problems they had on the learning exercises. The students assigned to the control group received the same number of tests (labelled "quizzes") but differed from the learning for mastery students in that there was no feedback or corrective procedures nor any small group discussions. Instead, the control students received supplemental worksheets which they were required to work on individually.

Results. In an effort to make this section more readable, the means and standard deviations of the affective measures for the mastery and nonmastery learning students are presented in Table 4. The hypothesis and results specific to this hypothesis follow.

Table 4
Means and Standard Deviations of Affective Measures
Before and After Experimental Treatment for Mastery Learning
and Nonmastery Learning Students

	Mastery Learning Students		Nonmastery Learning Students	
Affective Measure	N	Mean (SD)	N	Mean (SD)
		Pretest		
Academic Self-Concept				
Total Group	47	11.19 (2.55)	46	11.83 (2.18)
Class 1	10	10.20 (1.81)	15	11.33 (2.09)
Class 2	18	12.39 (2.03)	21	12.33 (2.31)
Class 3	19	10.58 (2.95)	10	11.50 (2.01)
General School Self-Concept				
Total Group	47	6.75 (.67)	46	6.91 (.35)
Class 1	10	6.60 (.97)	15	6.87 (.52)
Class 2	18	6.94 (.24)	21	6.95 (.22)
Class 3	19	6.63 (.76)	10	6.90 (.32)
Norm-Referenced Self-Concept				
Total Group	47	1.51 (1.61)	46	2.07 (1.47)
Class 1	10	.90 (1.10)	15	1.53 (1.51)
Class 2	18	1.94 (1.66)	21	2.29 (1.52)
Class 3	19	1.42 (1.74)	10	2.40 (1.17)

Table 4 (continued)
Means and Standard Deviations of Affective Measures
Before and After Experimental Treatment for Mastery Learning
and Nonmastery Learning Students

	Mastery Learning Students		Nonmastery Learning Students	
Affective Measure	N	Mean (SD)	N	Mean (SD)
		Posttest		
Academic Self-Concept				
Total Group	47	11.36 (2.77)	46	11.57 (2.28)
Class 1	10	10.40 (1.78)	15	11.07 (1.91)
Class 2	18	13.06 (1.89)	21	12.29 (2.05)
Class 3	19	10.26 (3.16)	10	10.80 (2.94)
General School Self-Concept				
Total Group	47	6.75 (.71)	46	6.78 (.66)
Class 1	10	6.70 (.68)	15	6.87 (.35)
Class 2	18	7.00 (.00)	21	6.86 (.36)
Class 3	19	6.53 (.96)	10	6.50 (1.27)
Norm-Referenced Self-Concept				
Total Group	47	1.70 (1.71)	46	1.98 (1.45)
Class 1	10	1.00 (1.16)	15	1.40 (1.35)
Class 2	18	2.72 (1.41)	21	2.33 (1.39)
Class 3	19	1.11 (1.79)	10	2.10 (1.60)

Note. The number of items in each of the affective measures were as follows: Academic Self-Concept (15 items); General School Self-Concept (7 items); Norm-Referenced Self-Concept (4 items).

H_1: Students in mastery learning instruction will acquire higher academic self-concept scores than students in nonmastery instruction.

This hypothesis (H_1) addresses the concept of academic self-concept in the measurement of student learning outcomes. This hypothesis is investigated by examining the scores of students in the two groups on three affective measures (Scott's Academic Self-Concept Scale and the two subscales logically and empirically derived from this scale: General School Self-Concept and Norm-Referenced Self-Concept). The means and standard deviations of these affective measures may be viewed in Table 4.

As can be seen in Table 4, certain trends seem apparent with respect to the two treatment groups. The means of the learning for mastery students either increase slightly (Academic Self-Concept Scale and Norm-Referenced Self-Concept subscale) or remain constant (General School Self-Concept subscale) from pre- to posttesting. On the other hand, the means of all three affective measures decrease slightly from pre- to posttesting for the nonmastery learning students. The pretest and posttest means of the General School Self-Concept and Norm-Referenced Self-Concept subscales for the two treatment groups are graphically represented in Figures 1 and 2, respectively, to illustrate the above trends.

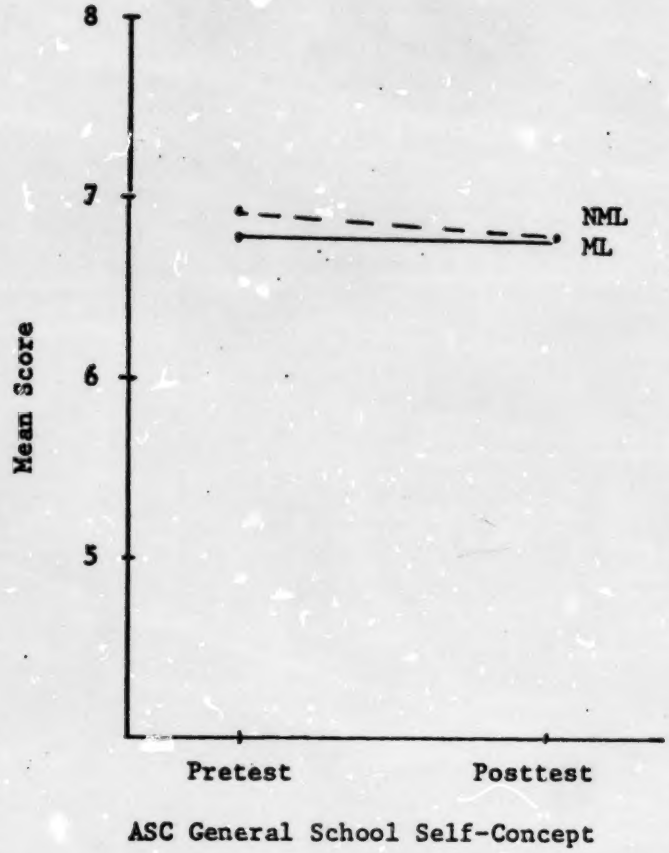

Figure 1. Mean raw scores of the mastery learning (ML) and nonmastery learning (NML) groups on the ASC General School Self-Concept subscale before and after the experimental treatment.

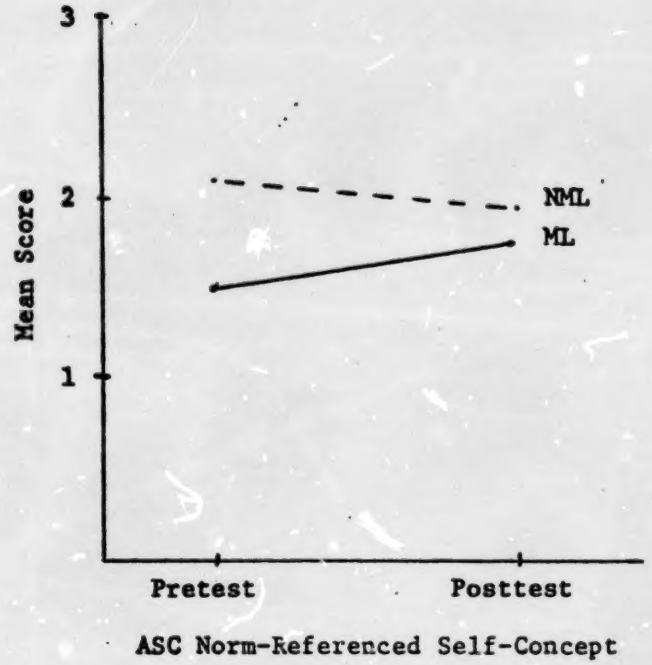

Figure 2. Mean raw scores of mastery learning (ML) and nonmastery learning (NML) groups on the ASC Norm-referenced Self-Concept subscale before and after the experimental treatment.

Table 5
Analysis of Variance for Scott's Academic Self-Concept Scale and Affective Subscales Before and After Experimental Treatment

Source of Variation	DF	SS	F-value
Pretest			
Dependent Variable: Scott's Academic Self-Concept Scale			
Group	1	9.36	1.77(ns)
Class (group)	4	52.88	2.50*
Within Cells	87	461.01	
Dependent Variable: General School Self-Concept			
Group	1	.66	2.26(ns)
Class (group)	4	1.24	1.06(ns)
Within Cells	87	25.35	
Dependent Variable: Norm-referenced Self-Concept			
Group	1	7.15	3.07(ns)
Class (group)	4	13.65	1.46(ns)
Within Cells	87	202.90	
Posttest			
Dependent Variable: Scott's Academic Self-Concept Scale			
Group	1	.96	.17(ns)
Class (group)	4	104.31	4.71**
Within Cells	87	481.85	
Dependent Variable: General School Self-Concept			
Group	1	.03	.07 (ns)
Class (group)	4	3.12	1.71 (ns)
Within Cells	87	39.64	
Dependent Variable: Norm-referenced Self-Concept			
Group	1	1.77	.81 (ns)
Class (group)	4	38.24	4.36**
Within Cells	87	190.57	

Given the results presented in Table 4 and illustrated in Figures 1 and 2, the learning for mastery group (which was slightly "inferior" to the nonmastery group on all three affective measures at the time of pretesting) seems to have narrowed the difference in mean affective scores with respect to the nonmastery group. However, these observations are based only on gross differences in the data. Correlated one-tailed t-tests reveal no statistically significant increases or decreases ($p > .05$) on the affective measures from pretesting to posttesting in either of the treatment groups. Furthermore, the ANOVA tables in Table 5 reveal no statistically significant differences between the mastery learning and nonmastery learning groups on the three affective measures before or after experimental treatment.[1] Thus the above interpretation has little statistical support. This hypothesis, therefore, is not supported by the data.

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[1]There are several possible reasons for this lack of statistical significance. One reason may involve a "ceiling effect"; that is, both treatment groups scored high on the affective measures at the time of pretesting. Also, the duration of the study may have been too short for any significant change in academic self-concept to have taken place. Finally, the instrument itself may have been too insensitive an indicator for the purposes of the study.

Conclusions and Implications

To determine whether learning for mastery students were better able than students in nonmastery instruction to acquire higher academic self-concept scores, the hypothesis was investigated by examining pre- and post-test scores of the students in the two groups on three affective measures (Scott's Academic Self-Concept Scale and two derived subscales: General School Self-Concept and Norm-Referenced Self-Concept).

The hypothesis was not supported by the data in that ANOVA results revealed no statistically significant differences between the mastery learning and nonmastery learning groups on the three affective measures before or after experimental treatment. However, certain trends seemed apparent with respect to the two treatment groups. The means of the learning for mastery students either increased slightly (Academic Self-Concept Scale and Norm-Referenced Self-Concept subscale) or remained constant (General School Self-Concept subscale) from pre- to posttesting. In contrast, the means of all three affective measures decreased slightly from pre- to post-testing for the nonmastery learning students.

Although the results revealed no significant differences between the mastery and nonmastery groups on three affective measures after experimental treatment, certain trends seem to favor the learning for mastery approach with respect to affective outcomes of school learning. As previously noted, the means of the mastery learning students either increased slightly or remained constant from pre- to posttesting while the means of all three affective measures decreased slightly for the nonmastery learning students. If one takes Kifer's (1975) view that it is the student's history of consistent success or failure (in terms of patterns of academic achievement) which attributes to the learner's affective traits, then the mastery learning instructional model should lead to increases in academic self-concept over an extended period of time.

An implication of this study stems from the finding that there was a "tendency" among students in mastery learning instruction to acquire gains in academic self-concept as opposed to students in nonmastery instruction. While the results revealed no significant differences between the mastery and nonmastery groups after completion of the experimental study, trends seemed to favor the mastery learning approach in terms of increased academic self-concept. If one accepts the position that the construct of self-concept is multifaceted and hierarchical in nature (cf. Bloom, 1976; Shavelson et al., 1976), the results of the present study should not be taken lightly. Although Bloom (1976) has shown that subject-related affect increases over short periods of time in favor of mastery learning instructed students, there is the question whether some of the more favorable findings in Type 2 mastery learning research might be attributable to a Hawthorne effect. However, in the present investigation, the more complex construct of academic self-concept was also shown to increase in students receiving mastery learning instruction over a period of 23 class days.

The results of this study should have straightforward implications in regard to the mastery model of school learning and academic self-concept. Kifer (1975) supports the notion that students develop affective characteristics concomitantly with academic "success" in the school environment. In the mastery learning model, students are helped to attain high levels of achievement; therefore, consistent high levels of academic performance over extended periods of time should also lead to high levels of academic self-concept in students receiving mastery learning instruction.

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